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FOCUS ON EXCELLENCE

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The Title II Advisory Committee includes members from many school districts, professional organizations such as the Massachusetts Association of Science Supervisors, Massachusetts Computer Using Educators, and Massachusetts Foreign Language Association, as well as representatives from the Massachusetts Department of Education. The successful implementation of Title II has been dependent upon the commitment, support, and high spirits of everyone in the Advisory Committee. The E.E.S.A. Title II staff would like to thank the Advisory Committee for their insightful input, time, effort, and above all, their good humor. We are looking forward to more years of happy cooperation.

PREFACE

Dear Friends,

The Commonwealth of Massachusetts, like many other states, has been committed to educational reform. Federal monies from Title II of the Education for Economic Security Act (E.E.S.A.) have been directed at improving education in the form of exemplary program grants. Administered by the state, these grants have provided for the identification and dissemination of exemplary programs in mathematics, science, computer studies, and foreign language. Programs for which exemplary program grants have been awarded are described in this publication. For more information on grant application or other issues related to E.E.S.A. Title II, please call your Regional Education Centers (see Appendix A).

For almost two years, we have had many discussions on what "exemplary" really means. We have visited many programs, reviewed many curricula, and talked with many teachers and administrators. We still do not have a precise definition for "exemplary", but we do know that there are many programs in schools across the Commonwealth, which have worked wonderfully for many students. Yet, most of these programs are not even known outside of the local school district. It has given us much pleasure to be able to learn about all these programs and to know the people who have made them possible. It has been especially rewarding for us to see that these programs can now be shared by everyone in the Commonwealth.

Many teachers have told us that the dissemination process has provided them experience and insight that they had never thought possible. We believe that their enthusiasm is really the indispensible "trade secret" which is planting seeds everywhere that they go.

We take pride in presenting the Title II Exemplary Programs as described here. We hope that you will continue to share your experience and talents in the years to come. Together, we can make a difference in education today.

John F. Reynolds
Felicia Tang Lee
Richard E. Cooper

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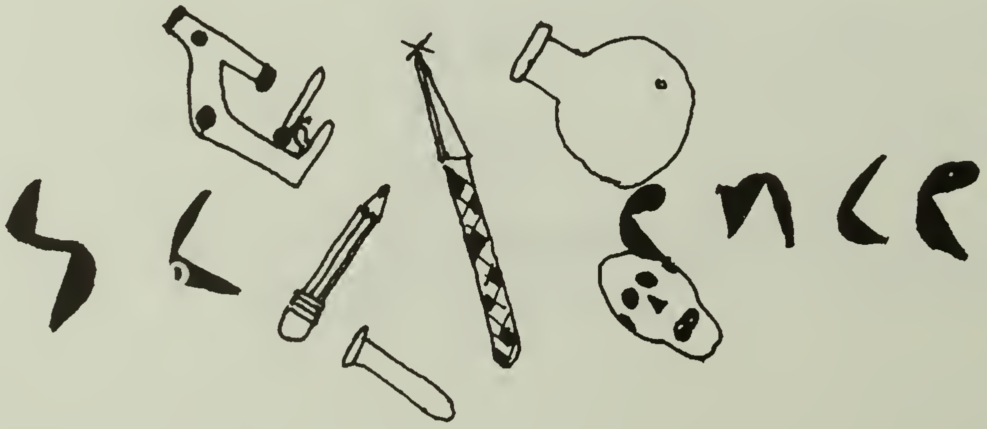
Science
Elementary School Level

Discovering Science with RIC
Andover Public Schools
Contact:
Annetta R. Freedman
Andover Public Schools
Bartlett Street
Andover, MA 01810

After using SCIS as the elementary science program for a number of years, three teachers decided to supplement it with their own activities. The result became known to the students as RIC Boxes, after the initials of the three teachers who pooled their efforts to develop the materials.

Three fifth grade teachers (Susan Rogers, Katherine Iworsley & Louise Cullinan) developed a group of 16 activities to supplement the program they had used for many years. As students work individually or in small groups, following the instructions accompanying each box, they keep a log of their activities and also record progress on a wall chart. As students complete each activity they select a new one, but with a new study group. Along with the additional materials, the teachers incorporate coaching techniques that were presented to them in one of the school system's in-service workshops. Since there is a significant amount of peer teaching involved, the learning disabled students are able to contribute to each group, and learn quite effectively.

The materials could be used to supplement most activity oriented elementary science programs and could be used as often or as seldom as needed. The teacher's role with these materials is changed from that of source authority, to coach or assistant to the students. For the teacher of the perceptually handicapped class there is the opportunity to work as an aide with the students in a mainstream setting.



SCIENCE
Elementary School Level

Horace Mann Elementary School Science Center
Boston Public Schools
Contact:
Charles E. Hughes
Horace Mann School for the Deaf
40 Armitage Street
Allston, MA 02134

Like many other elementary schools, there was no formal science program, and the science curriculum material that had accumulated over the years was seldom used. The Horace Mann Science Center grew out of the need to bring the school program in line with the science curriculum and to teach deaf children practical science skills.

The features are unique, since the Horace Mann Elementary Science Center follows the teaching structure of the Boston Public School Science Curriculum using the hands-on materials from the Science Curriculum Improvement Study (S.C.I.S.) program. The life sciences are demonstrated daily with a wide variety of fish, amphibians, reptiles, and mammals that are permanent residents of the Science Center. To meet the need for a greenhouse, the end of one south-facing hallway was temporarily enclosed and fitted with shelving. In addition to supporting classroom science needs of the students, older students receive vocational experience as they care for the plants and animals, and the primary grade classes use the Science Center for in-house field trips.

The program is presented in total communication. Aspects of this program would be useful to any science department which has the need for first hand science experiences that maximize the opportunity to develop language skills.

Remarks
Visitation is limited to Tuesday and Friday, by appoinment only. Please call Mr. Hughes directly at (617)787-5313.

SCIENCE
Elementary School Level

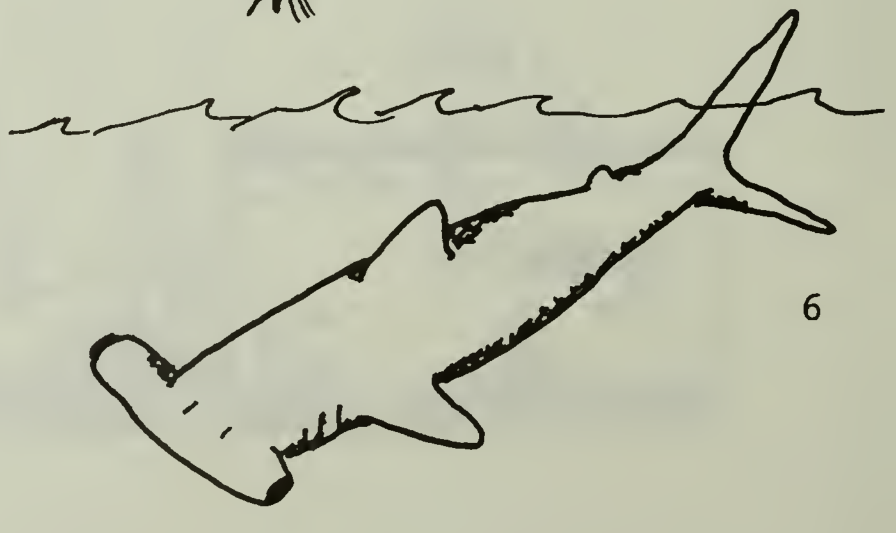
Stars, Rocks, and Sea Creatures
Boston Public Schools
Contact:
Carole H. Miller
Agassiz School
20 Child Street
Jamaica Plain, MA 02130

"Stars, Rocks, and Sea Creatures" is a science/language arts program in which students in grades 2 to 4 function as young scientists -- observing, recording, measuring -- while improving their vocabularies, learning to write descriptively and to read materials of ever increasing difficulty.

The program consists of three modules: astronomy, earth science and marine science. Activities in each unit are similar in that they are HANDS-ON. Children observe hermit crabs, or record what they find in soil, or measure the length of shadows. WRITING is a daily activity, whether it be a letter to an astronaut or a story about what it would be like to be a rock. Children are encouraged to express themselves ORALLY in circle discussions, by asking questions of visitors, or by sharing reports and stories. Students are given time to READ trade books on the current topic, which the teacher makes available in the classroom. Whenever possible, children are brought into contact with real things and persons and places.

Although the program was developed with bilingual children, it has been used successfully with regular education and special needs students. One of the strengths of the program is its flexibility. Units need not be taught in any particular order, nor is it necessary that all three units be pursued in a single school year. A second strength of the program is its low cost to implement and maintain. A third strength is the multipurpose character of the activities which enable teachers coping with a crowded curriculum to address more than one set of objectives at a time.

Remarks
Workshop maximum: 20 teachers.



SCIENCE
Elementary School Level

Burlington Science Resource Center
Burlington Public Schools
Contact:
John Papadonis
Burlington Science Center
123 Cambridge Street
Burlington, MA 01803

The objective of the Burlington Science Center is to expose students in the elementary grades to a variety of scientific areas that cannot be achieved by their classroom teachers due to limited availability of hands-on materials or limited training in the area of science. The philosophy in this program is that a student should leave elementary school with a well balanced exposure to all sciences - life, earth, physical, and applied. This exposure should also include lessons on current scientific events that a textbook could not cover.

The Science Center visits classrooms with special interest lessons including live animals and physical science experiments. Lobby displays are constructed at the Science Center and set up in each school lobby for a period of time giving students an opportunity to interact with an area of science on their own. There are large auditorium programs which involve the entire school. The Science Center also provide K-5 teachers with training sessions, traveling classroom exhibits, resource texts, and learning kits. It also provides help to any teacher who would like to cover an area of science that requires special materals or exciting ideas.

A science center is a non-threatening way to offer teacher support and assistance in all branches of sciences and at almost all grade levels.

SCIENCE
Elementary School Level

The Green Classroom
Falmouth Public Schools
Contact:
Joy Cooke
Teaticket School
45 Maravista Ext.
Falmouth, MA 02536

Four elementary schools in the Falmouth Public School system work in conjunction with the New Alchemy Institute to provide a series of science-based introductory lessons. The program involves children in high interest activities which develop SCIIS concepts in a more meaningful context, and make broader environmental concepts personally relevant to the students.

Each of the lessons in the program includes information research, field experience, classroom discussion and presentation. Students are taught to practice the scientific method. They work in groups to discuss their results, and make an oral presentation. In their discussion, they use actual data and information they have obtained from other sources. Individual group members contribute to the discussion by sharing their factual knowledge on the subject. They make a prediction and share the hypothesis with the class. Writing projects grew out of the program. Math and art are also worked into the lessons.

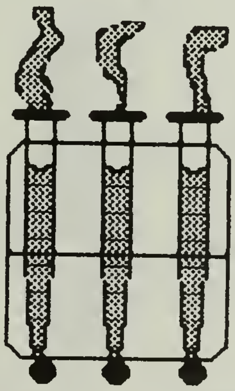
This program builds an appreciation of nature and enhances environmental awareness and responsibility in the students. It offers opportunities for students to go beyond the regular classroom onto hands-on activities. "The Growing Classroom" is an excellent model of collaboration between school systems and community resources.

Holyoke/Hitchcock Bilingual Science Enrichment Program
Holyoke Public Schools
Contact:
David Groesbeck/Olga Amaral
Dr. M.R. Kelly School
216 West Street
Holyoke, MA 01040

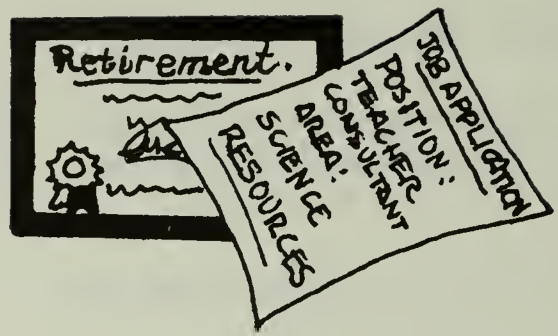
The purpose for implementation of the Bilingual Science Enrichment Program is two-fold: (1) to create situations and provide models for teachers to create situations in which children can use their imaginations and playfulness to explore the world and discover scientific principles, (2) to fill a gap between Spanish science textbooks and English science textbooks. Students with low English proficiency had to use science textbooks which were completely different in scope and sequence from the English textbooks. In response to these needs, the Hitchcock Center and the Holyoke Public Schools formed a partnership to provide hands-on science lessons in both English and Spanish to fifth-grade classes in the school systems.

Two staff members from the Hitchcock Nature Center of Amherst teach the lessons in English and Spanish, from a script prepared by the staff. When asked questions, students wait for both versions of the questions before they respond in the language they use best. All written hand-outs are in both languages. Teachers are given pre- and post-lesson instructions and ideas, and are given a compendium of all lesson plans and hand-outs at the end of the year so they can duplicate the lessons on their own.

The program has created a Spanish-translated science curriculum with a hands-on, environmental focus. It integrates art, writing, math, and social studies; and it is easily adaptable to both rural and urban settings. Using the resources and experience of a local community institution can reduce the cost to the schools quite significantly.



SCIENCE
Elementary School Level



Grandteacher Program
Marlborough Public Schools
Contact:
Larry McGowan
Bolton Street
Marlborough, MA 01752

After 30 years of successful high school experience a physic teacher retired and was subsequently hired as a consultant or resource teacher for the elementary schools. The goal of this program was to retain the talent and experience of a retiring teacher, and share it with elementary teachers who have no other science resource. Many educators have talked about the concept, but no one else in Massachusetts seems to have been able to implement it as successfully.

In his new role, the grandteacher presents workshops for elementary teachers, and also teaches demonstration lessons in 29 classrooms at 5 elementary schools. The classes supplement the existing elementary science program and are the hands-on variety, using simple, inexpensive materials. As a result, the elementary teachers develop a repertory of science lessons and students will hopefully develop a positive attitude toward science.

The model is that of a science consultant/resource teacher. It could be used equally well with any subject area. The cost to the school system is minimal, the teachers are happy, and irreplaceable knowledge and experience are not lost at the time of retirement. It is a perfect win - win situation.

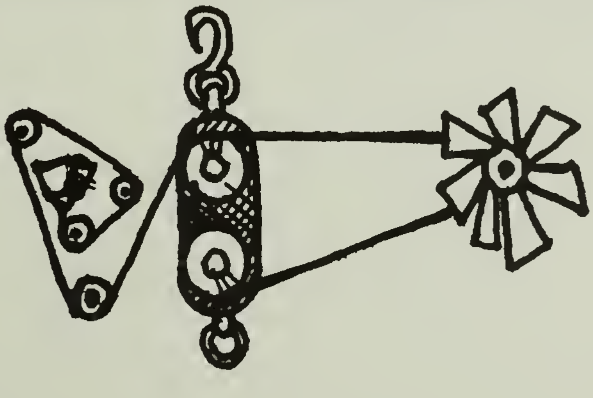
SCIENCE
Elementary School Level

Simple Machines
Mendon-Upton Regional Schools
Contact:
Dan Malloy
Miscoe Hill Middle School
Box 7
Mendon, MA 01756

When a teacher wanted to make science instruction more meaningful to his students, he changed the activities and equipment to more realistically relate classroom experiences to the real world. Instead of using small scale equipment and lifting, at most, a few kilograms, the equipment in his program allows children to work with all the force they are capable of. As a result, the students get a better idea of the mechanical advantage provided by simple machines. The machines used include a half-ton block and tackle, single pulleys, a large scale wooden wheel and axle, and a boat trailer winch. Suggestions for other adaptations are available.

This teacher's 10 years of development can serve as a model for other teachers to create their own materials or to adapt "text-book" lessons to realistic hands-on activities. Because each student feels and sees the force or mechanical advantage gained by using simple machines, interest in science increases and true understanding and application of the concepts is achieved. Children with reading difficulty as well as those who learn easily from textbooks are successful. This particular topic fits into nearly all elementary science programs since simple machines is a universal concept. Because of the activity, science lessons appeal equally to both boys and girls in this classroom.

Encouragement for this teacher to share his program with others came from a colleague who noted the unique approach and subsequent results. Many elementary teachers could use the specific activities he has developed, or the general concept that these and other activities are based on.



SCIENCE
Elementary School Level

Environmental Center for Our Schools (ECOS)
Springfield Public Schools
Contact:
Robert Dionne,Science Supervisor
195 State Street
Springfield, MA 01103

Teachers in the mid-70s developed an outdoor environmental science program in a 745 acre public park that is still a major part of the Springfield elementary science program. All grade 4, 5, and 6 youngsters in the Public Schools and some parochial school students visit the site each year. Training has also been provided for approximately 300 classroom teachers whose students take part in the program. The concepts covered in each grade are:

Grade 4 - Interrelationships and interdependence of all living things in a natural community (Pond, Forest, or Field)

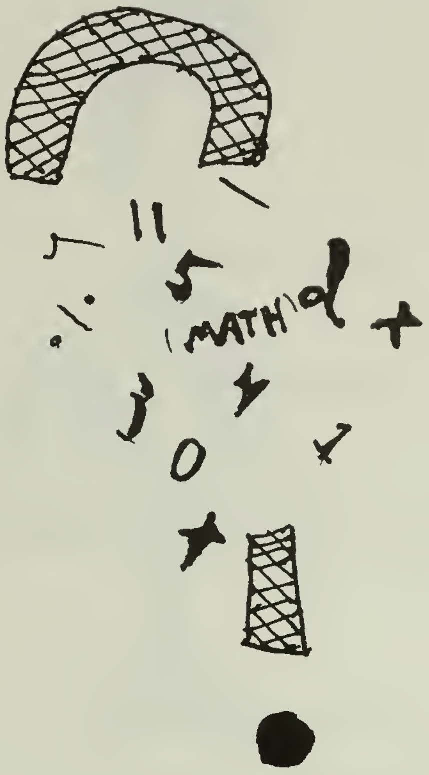
Grade 5 - Adaptations, seasonal changes and succession

Grade 6 - People's role in the natural environment and survival activities.

Activities are scheduled at the site throughout the school year, and classes are held daily, regardless of the weather. Advanced preparation and follow-up activities are carried out in the regular classroom. Over time the program has evolved to keep in step with current environmental topics. The end result is to graduate students with the ability to make better environmental decisions in the future than adults have made in the past. This program has received many awards, and is one of the few environmental programs of the 70s which has not only stood the test of time, but flourished.

The program is complete and can offer assistance to anyone interested in an environmental science program. This includes curriculum guides and descriptive literature, staff development, program goals and objectives, or assisting a school to tailor a program to the available environments or outdoor facilities. The scope of adopters programs could be as small as a single classroom at a local pond, field, or forest, to a system wide program at a number of different environmental locations.

Science/Math
Middle School/High School Level



New Technology Applications in Math and Science Education

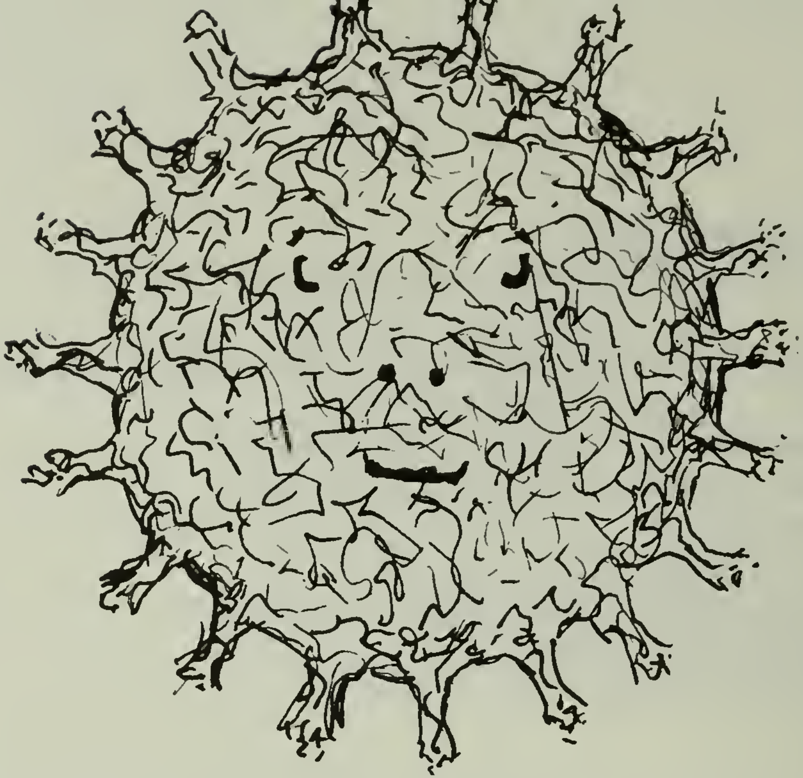
Merrimack Education Center
Contact:
John Phillipo
Merrimack Education Center
101 Mill Road
Chelmsford, MA 01824

This program is designed to provide teachers an awareness of the new technology applications and offer them program development support and implementation guidelines for the integration of technology into their math/science curriculum. A primary objective is to assist teachers in revising science courses and to conduct course planning in the middle school. The Lunenburg Public Schools and the Tewksbury Public Schools are currently collaborating with the Merrimack Education Center in using the problem solving model for their science curricula.

This MEC program provides three model lesson plans that have been developed and field tested by teachers of the MEC curriculum development framework. These models deal with problem solving in science using database, spreadsheets, and graphics. The MEC program also provides a demonstration program on the utilization of videodisc technology as an effective teaching tool in science education.

The model lesson plans were designed for and field tested with students and teachers in grades 6-8. This particular grade level was selected as being the point in the school curriculum where levels of problem solving could be identified and students would show evidence of advancing to a higher level of thought process because they were ready to move to stages of formal logic. However, the staff development and training activities related to this project can be used for teachers in grades 4-12. The staff development component for this project is quite modular and can be readily customized based upon the abilities and experiences of the teachers.

SCIENCE
Middle/Junior High Level



Sunwatch
Weston Public Schools
Contact:
John Stasik
Weston Middle School
Weston, MA 02193

The Sunwatch Program grew out of a need to give students a hands-on experience with earth rotation, inclination of axis, revolution and seasonal changes. These major concepts in an earth science curriculum are most frequently taught using charts and models, but the Sunwatch Program teaches and reinforces these concepts with actual data while seasonal changes occur. As a result, students not only learn earth science, but also learn that scientific study has to include observation, hypothesis, test for the hypothesis, and prediction and application.

The Sunwatch Program is a major part of the 8th grade science program in Weston Middle School. It is a year-long project focusing on both Equinox and Solstice dates. The students use a very simple apparatus consisting of a large board and a vertical hanger wire, to obtain actual data of the Earth's position with respect to the sun as the Earth moves around the sun. Students compare data, make charts and graphs, and finally analyze and interpret data. Towards the end of each year, the students design a "Reasons for Seasons" button. They wear their buttons to spread the enthusiasm and to get other students in the school interested in science.

This program can be used to teach a variety of academic skills and concepts in science, math, and geography; and it can be easily modified to fit the needs of students at various levels. The equipment used is simple to build and use. The teacher, Mr. Stasik, has been collecting data for three years, and many technical limitations have been overcome and data have been verified. The procedure can now be used with consistency and accuracy.

Remarks
(1) Class Size - An ideal class size would be under 25 students.
(2) Lots of sunshine, of course!

Science
High School Level

Psychobiology
Cambridge Public Schools
Contact:
Alan Weinstein
Cambridge Rindge and Latin
459 Broadway
Cambridge, MA 02138

This course was developed by a teacher with the notion that an interdisciplinary approach was essential to the understanding of behavior. Students at the senior high level need to be motivated to make connections between disciplines that are too often perceived as separate fields of study. By demonstrating the application of such an approach, the course inspires students to integrate modes of thought from diverse disciplines, most notably biology and psychology.

Thus, the curriculum deals with the intersection of biological and psychological perspectives in explaining animal and human behavior. In addition to informative lectures, in-class debates, discussion of personal experiences, audio-visual material including feature length films, and an occasional museum visit constitute the major pedagogical methods of teaching. Up to this point there has been no textbook, although rising copying costs might alter this situation. Students have been given reading and worksheets selected from original source materials, journals, newspapers, fiction and non-fiction books. In-class labs are done whenever possible and subjective writing is encouraged and is the major source of evaluation in the course. Research projects are also a requirement.

The mode of presentation used in this course enables students to learn that their opinion is valuable, and that important questions often have no right or easy answers. Motivated students are challenged to redefine disciplinary boundaries and to see the true meaning of a liberal arts education.

Remarks
Workshop restrictions: based on time and schedule constraints of presenting teacher.

Science
High School Level

Experiments in Animal Behavior
Franklin Public Schools
Contact:
William Fiske
Franklin High School
Oak Street
Franklin, MA 02038

The desire to provide a lower level upper class science elective without the rigorous demands of the classical courses led to the development of Experiments in Animal Behavior. This program which started nine years ago as a semester course is now a full year course which provides students with a scientific methodology while paralleling the behavioral discussions found in a typical psychology course. Enrollment in this course has remained stable in spite of declining enrollment in the school.

The course is designed for students who have middle to low level performance records in school and centers around individual and group experiments or projects. Many of the activities are non-traditional student designed, and require students to learn construction techniques with plastics, wood, and metal. The emphasis is on the scientific method, and experimental write-ups are evaluated as test grades. The experimental nature of the course is encouraged by the mini-museum setting of the classroom. The text for the course has been compiled by the teacher over the duration of the course and contains relevant readings and supplemental information. Volunteer lab aides help to maintain the proper conditions of the animal "exhibits."

The course is thoroughly developed and available for those wishing to adopt it. Activities make use of free and inexpensive materials. The method trains students to be thorough in their observations and record keeping, valuable skills which can be applied to most adult life activities.

SCIENCE
High School Level

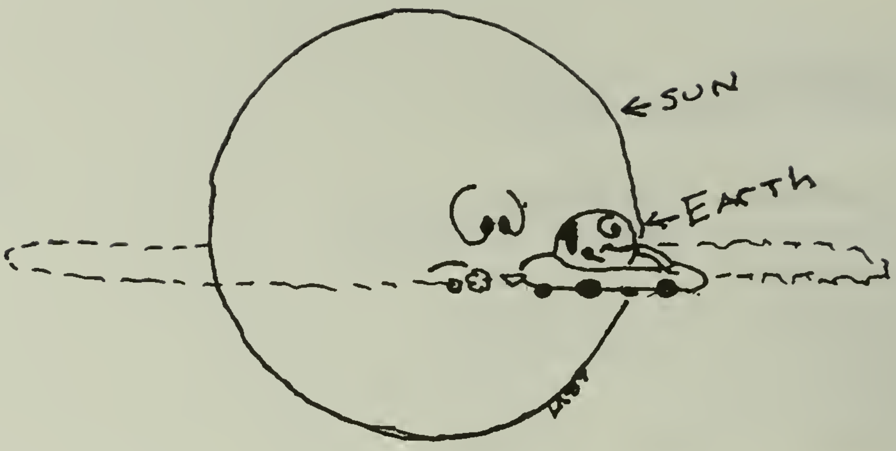
Freshmen Science

Franklin Public Schools
Contact:
Charles Vaillancourt
Franklin High School
Oak Street
Franklin, MA 02038

When contemplating the focus for a freshman level science course, oceanography was selected as the theme. What started as a ten week "quarter course" expanded to a half year, and finally to full year elective offering. The original intent was to have an alternative to the low-interest general science course, but it now serves the needs of nearly 100% of the freshman class.

This multi-level freshman science program is team taught and utilizes oceanography as the vehicle for the study of geology, chemistry, physics, meteorology, biology, ecology, and astronomy. Class activity varies from laboratory exercises, field trips, computer simulations, and video taped presentations to summary lectures and discussions. The classroom environment is museum-like and encourages long-term experimentation as well as independent study. It resolved the conflicting needs of a second year biology course, a pre-chemistry and physics course, and it remedied many of the deficiencies in students with different backgrounds. Upper class students volunteer as lab aids to maintain the water filtration system and the sea animals, and to assist freshman during the larger class activities.

The interdisciplinary nature of the course allows for individual science teacher's strengths to be utilized as well as meeting diverse student needs. The organization and modifications of the classroom offer a stimulating environment for students. The non-commercial nature of some of the displays and equipment offers interested students an opportunity to become involved with the class in ways not usually available in most high schools.



Physical Technologies

Marblehead Public Schools
Contact:
Bruce Buckley
2 Humphrey Street
Marblehead, MA 01945

Every high school has a group of students, often the underachievers, who do not take science courses beyond the minimum requirement for graduation. Because there were no meaningful course offerings, these students were graduating without the minimal understanding of science needed to deal with the problems facing society today. The program started as a single section of a semester course and is now scheduled for two sections as a full year course. Because of student interest in this program, more than 93% of the student body at the high school is enrolled in science.

The course is designed with activities structured around situations that are familiar and of interest to these students. The process oriented, problem solving approach often uses equipment that is constructed by the students before they carry out the investigation and collect data. Topics included are mechanics, chemistry, motion, heat and light, meteorology, and astronomy. A sample of the activities includes field problems in triangulation, model rocketry, weather forecasting, crystal growing, tracking moving objects, and taking astronomical measurements. Much of the success is creating an atmosphere in which the students want to know the answers to problems or the outcomes of experimental situations. At present there is no commercial program in physics or natural science which serves the needs and interests of these students.

Any high school could use this program as it is to teach science to the students who do not usually elect science courses. However, the content of the course is continually changing as new problems and situations present themselves. Because of the dynamic nature of this course, it could be used as a model for anyone who wishes to effectively appeal to students who are not interested in school or in a particular subject.

Unified Biology/Chemistry

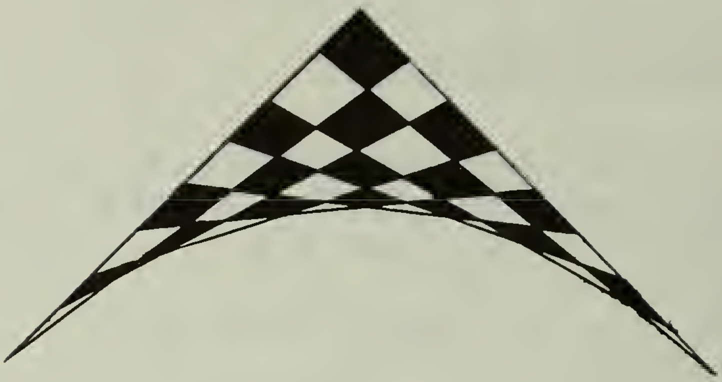
Southern Berkshire Regional School District
Contact:
Wayne Eline
Mt Everett Regional High
P.O. Box 239
Sheffield, MA 01257

The need which gave rise to this program was the realization that science was not created in separate disciplines, but has been divided in the past merely for the convenience of scientists. Many science educators share the feeling that most of today's students are exposed to an unnatural studying of the natural sciences. The Unified Biology/Chemistry Program is a two year course. Course contents are presented in a logical sequence, with planned repetition and duplication of concepts to show the wider application to other fields of science. The program is offered to the students with the theme that science proceeds from observation to the establishment of general principles. Students are trained to reapply information once learned.

Instead of the traditional biology-then-chemistry sequence, students in the Mt Everett Regional High School may choose a two-year course in which both biology and chemistry are covered. At least two teachers are working very closely together in designing course materials, references, and scheduling. Although the course is taught using the B.S.C.S. and the Chem Study Program as the basic texts, several books are concurrently used as a reference group. Evaluation of this program was conducted within the high school, with a test group of students taking the two-year course and a control group of students taking the traditional sequence. Results showed that the test group had a 20% better growth after two years.

Students taking the two-year biochemistry are learning, thinking, and experiencing both biology and chemistry for two continuous years. This allows the students to better understand and apply the fundamental concepts in the two disciplines. When more than one area of science are studied at one time, the ability to use more than one approach to solve problems is enhanced.

MATHEMATICS
Elementary/Middle School Level



Math through Instructional Gaming

Boston Public Schools
Contact:
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Mackey School
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Boston, MA 02116

The instructional gaming program has grown from the need for materials appropriate for students of varying abilities, and the need for group activities in math to raise peer support and engage students directly. The program utilizes mathematics games which serve to supplement and reinforce skills taught in class, to provide motivation for new challenges, and to help students develop problem-solving skills.

Students are organized in a tournament structure and in teams, thus balancing competition with cooperation. They receive individual and team scores, which encourages them to tutor each other. Students experiment with many ways of manipulating symbols and solving problems. Many games culminate with a player challenging a move made by another player. The students have to explain the moves and challenges they have made, in effect, explaining the math skills they have used. The program can also include the use of computer software programs as well as manual games.

Games such as those used in this program provide motivation for learning mathematics skills, since skills, insight, and facts to be learned are clearly needed in order to succeed. The competition is structured such that the probability of a given student winning a given game is the same for all students. The hierarchical tournament structure increases the probability of most success for the low-ability students of more general academic skills. The tournament structure, while offering challenge to gifted students, also encourages them to tutor others. The computer software offers further challenge, remediation, and diagnosis for all students.

MATHEMATICS
Elementary School Level

Brookline Chapter I
Brookline Public Schools
Contact:
Charlotte S. Laven
Lincoln Primary School
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Brookline MA 02146

In 1987, a needs assessment indicated that special programs should be provided in reading and mathematics. The study also indicated that remediation should be individualized, coordinated with the classroom program, and involve parents.

The resulting program offers remediation for 3rd, 4th, and 5th graders at two schools. After determining each student's strengths and weaknesses, an individualized educational plan is developed. The students work daily with the teacher or the aide, or both, to advance at their own pace. The specialist works closely with the classroom teacher, and parents are informed of the progress of the student and of the group. Significant portions of the curriculum are devoted to the meaning of operations instead of the mechanics, and problem solving is emphasized throughout the year.

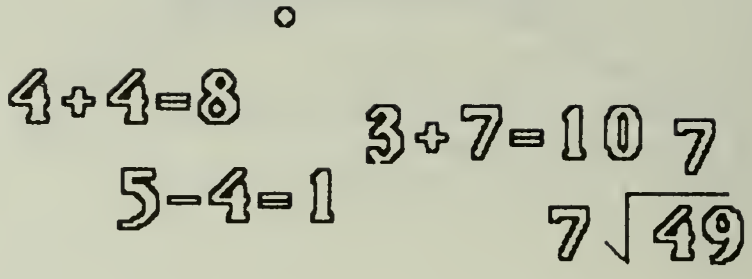
This program can be a model for improving remedial services in mathematics, or for selecting and training community parents to be aides and to work well with the teacher as a team.

IT'S AN ADVENTURE!

Mathematics
Junior High/High School Level

A Non-Algebra Sequence
(Limited English Proficiency)

Amherst-Pelham Regional Schools
Contact:
Michael Froning/June Wilby
Amherst Regional Jr. High
Chestnut Street
Amherst, MA 01002



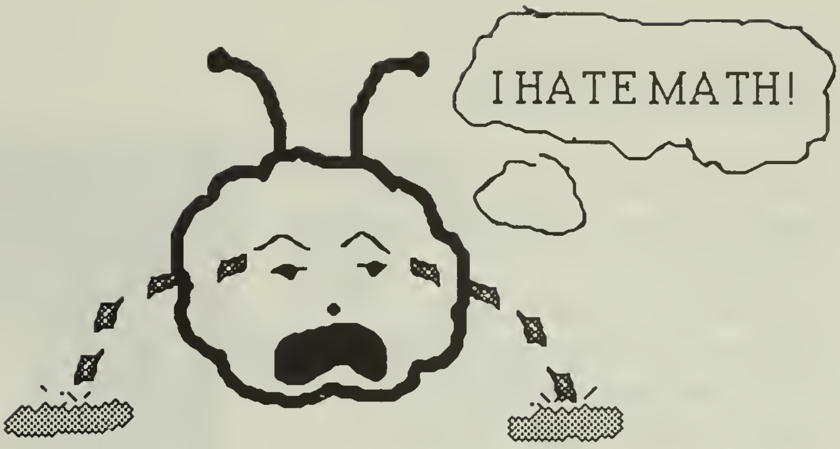
The Non-Algebra Sequence was started at Amherst in 1979, in response to the need of strategies to work with a large population of second language speakers. Currently, the majority of these students are refugees from Cambodia and Vietnam. These students range in age from 14 to 23, some having never had formal schooling before they came to America.

The Non-Algebra Sequence begins with a one-semester course called Arithmetic. This course, or a test-out of it, was required of every student upon entering the 9th grade. The course is not included in the weighted grading system. A student who enrolls in the course can take longer than one semester to finish the course. The criterion for leaving the course is that the student master the objectives. The second course is Calculators and Computers. Students successfully completing this course can choose to follow the traditional algebra sequence or to move through the rest of the non-algebra sequence. The other courses in the non-algebra sequence are Informal Geometry, Consumer Math, Life Skills Math, and Career Math. The lessons in the first two courses in the Non-Algebra Sequence are oriented toward the teaching of the language of mathematics and the internalization of the basic concepts of elementary math. There is an emphasis on review that is perhaps not necessary for students who are learning in their native language. Most important in the program has been the building of confidence through success and understanding.

The Non-Algebra Sequence can serve many other student populations, such as math anxious or phobic students who have intelligence but no confidence, deaf students, disabled students, dyslexics, and many students who just were not interested in mathematics.

Mathematics/Computer Studies
High School Level

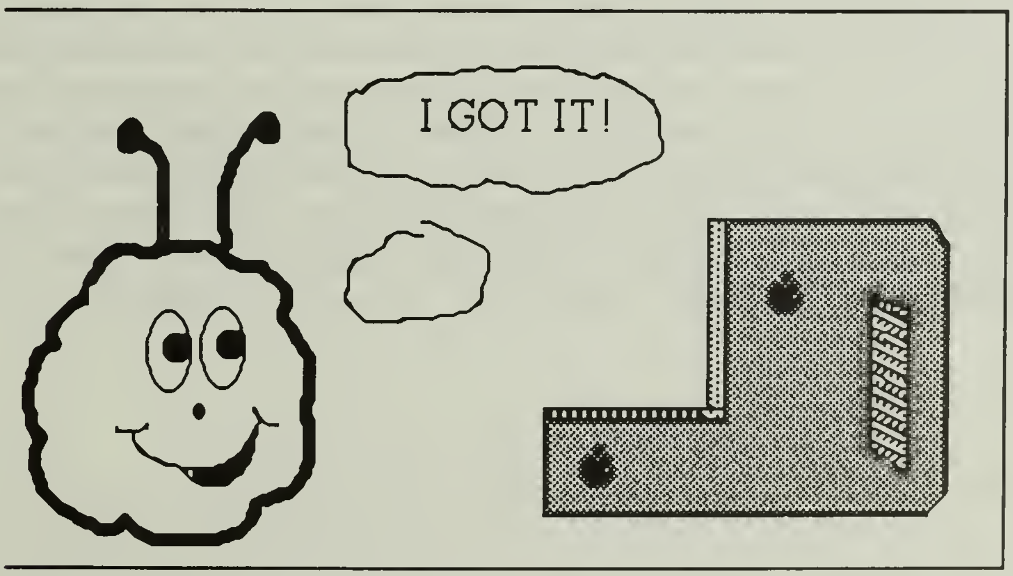
Integrating the Computer
with
Consumer Mathematics
Belmont Public Schools
Contact:
Bill Stone
Belmont High School
221 Concord Avenue
Belmont, MA 02178



This program is designed for students who have special needs, who have failed the Basic Skills Test. Students who have difficulties dealing with mathematical concepts or logic are forced to go through the process of problem solving when they write a program. Exposure to and hands-on experience with microcomputers put students in contact with machines and hence give them a demystified view of the technological world. It may be a first step towards elimination of technology phobia. Students having difficulties concentrating are kept busy throughout the entire period.

The teacher who designed the curriculum also teaches the class. Another teacher, in special education, helps the students during class and when they study later on in the Learning Center, providing reinforcement whenever and wnerever possible. There are two essential parts in the curriculum, a comprehensible text book on survival mathematics, and student generated computer programs in BASIC used to solve the problems in the text book.

This program can be easily modified for students in the mainstream and even for the gifted students.

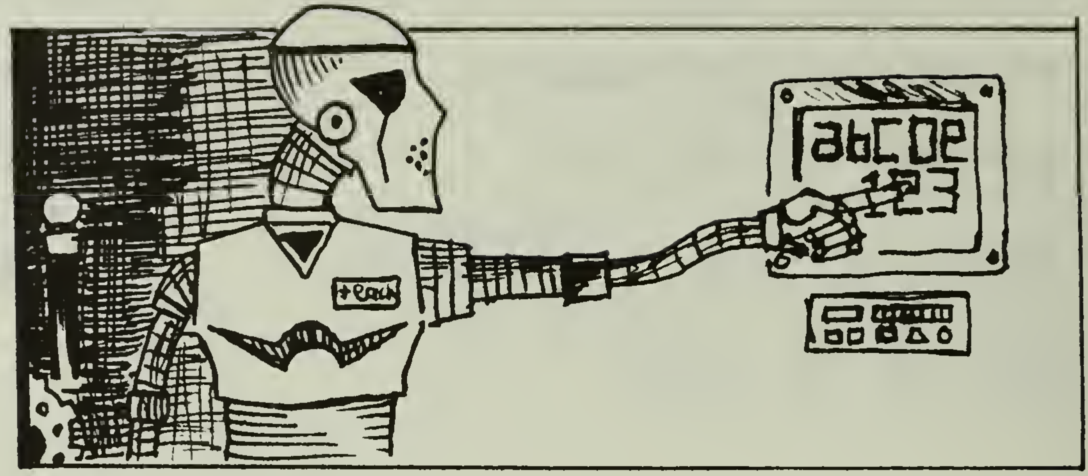


Computer Studies

Elementary/Junior High

School of the Future

Cambridge Public Schools
Contact:
Michael Tikonoff
Tobin School
197 Vassal Lane
Cambridge, MA 02138



The City of Cambridge saw the need for the application of technology in education. The School of the Future was created to serve as a system wide model whose successes are to be disseminated and replicated. Teachers within Cambridge may visit to get ideas and support. The School of the Future staff offers staff development workshops to other Cambridge faculty. There is a school community involvement with educators from universities, computer/software professionals, and business representatives.

The School of the Future is a city-wide magnet K-8 program. It is an autonomous self-contained program in which the computer is integrated in all disciplines. Problem solving is the theme throughout the entire curriculum. Each classroom (grade) has its own central topic for a period of time (from one month to one half of the school year). This central topic is used to develop interdisciplinary learning activities. All students are involved with activities developed around the central topic. Word processing, database, and spreadsheet packages are also major parts of the program. The teachers in the School of the Future rotate to become the program manager. Each manager serves a one year term, during which he or she would not teach at all but would be totally responsible for coordinating the development of the program, raising funds, and other administrative duties.

Cambridge is a desegregating school program. The School of the Future boasts a large student enrollment and a waiting list to enter the program. It is a model program which serves children from various socioeconomic groups. The program also has a special needs component (a self-contained learning disabilities classroom). Although the start-up costs for a city-wide program such as the School of the Future can be high, once the program is started, its operating budget would be greatly reduced.

Computer Studies
Elementary School Level

The Computer - Another Learning Tool

Dover Public Schools
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Dover, MA 02030

The Dover Elementary Schools began their computer program in response to the need for elementary school students to be prepared for this technologically oriented society. The objectives of the computer program fall into three broad areas:
(1)to develop computer awareness, (2)to further thinking and problem-solving skills through computer programming, (3)to use the computer as a learning tool.

There is a sequentially planned curriculum for grades K-6. This curriculum is based primarily on LOGO. However, there is also an extensive integration of software into reading, math, health, science, and social studies. An ongoing computer committee, made up of classroom teachers, meet regularly during the school year to evaluate all aspects of the program. They participate in summer workshops to update and revise the curriculum, preview software, and recommend the purchase of new materials. A combination computer lab/classroom set-up also allows teachers to not only provide whole class instruction, but also permits individualized follow-up practice.

The curriculum has been expanded to meet the needs of different populations. All children from kindergarten through sixth grade are involved in the program regardless of their computer background or ability. The special needs room at each school has its own computer, printer, and software library. Gifted students in the upper elementary grades who have shown excellent progress in the defined program, and are motivated to explore further, are introduced to a new language, BASIC. A primary emphasis of the Dover Elementary School programs is to use the computer as a tool to enhance, not to replace, learning of conventional subjects and skills.

COMPUTER STUDIES
Elementary/Junior High Level

Computer Integration
Union#47 Bolton/Stow
Contact:
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Emerson School
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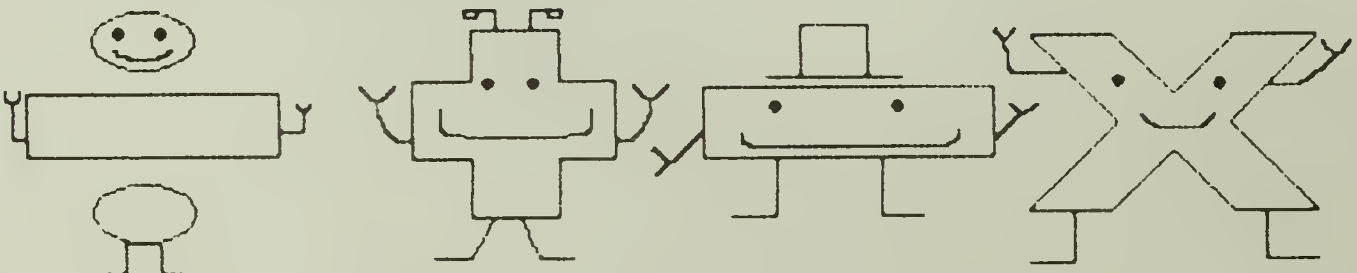
Bolton, MA 01740

The major goals of the computer program at Emerson School in Bolton are to integrate the use of computers into the existing curriculum and to prepare students for life in a technological society. In the third year of implementation of the Three Year Computer Instruction Plan, the program has a broadbased curriculum for grades 3 through 8, which incorporates language arts, social studies, health, science, and mathematics, with an emphasis on word processing.

Although the computer specialist is the one person responsible for developing and implementing the plan for the program, all teachers do participate. With all grades from K to 8 in one school building, there are constant casual contacts of teachers and students with the specialist. Hence, the needs of both teachers and students are well served. The major teaching team for all students in grades 6, 7, and 8 consists of one class per week with the computer speicalist, who is a former language arts teacher, and a math teacher. In grades 3, 4, and 5, the classroom teacher acts an aide to the specialist in the weekly computer class, thereby gaining experience and expertise. Each classroom at this level has a computer for continuation of the class activity. A volunteer aide offers additional support. Special needs students receive additional support through the resource room. Extracurricular activities, including the publication of a school newspaper and a yearbook, serve as tools for reinforcement.

This program is an example of a well integrated program. It also serves as a very good equalizer for those who have a psychological or physical handicap. A comprehensive plan is now available to be shared among educators. Any school system interested in developing a curriculum can use this plan to set up program priorities, to plan on using limited resources efficiently, and as a basis for budget allocations.



COMPUTER STUDIES
Middle/Junior High

Excellence through Technological Application
Boston Public Schools
Contact
Michael Fung/Irene McCarthy
W.H.Taft Middle School
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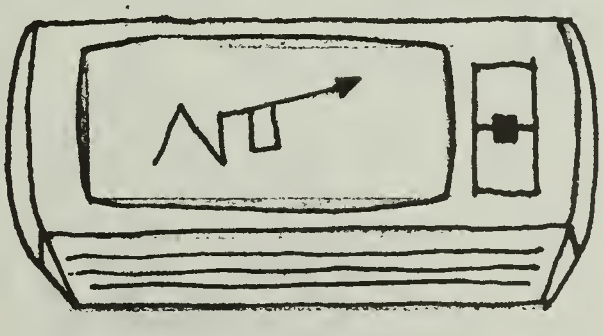
Brighton, MA 02135

A major goal of the computer program at Taft is to improve the academic performance of the students. Through instructional applications of the computer, students should be able to read, write, compute, and think better. The computer is adopted in the classroom as a dynamic productivity tool for the improvement of learning. Very little CAI is used. Once students have mastered the routine operations of the computer and its application programs, the concepts learned are integrated into the regular curriculum.

The Taft computer education program is comprehensive, with nine full-time computer teachers, and 140 microcomputers located in six computer labs and an administrative center. More than 90% of the staff members are familiar with the use of microcomputers. All Taft students are required to take 3 years of courses in keyboarding, word processing, data management, graphics, and programming in **Logo** and **True BASIC.** The Taft School also has a software library of over 800 programs, estimated at a value of over $50,000. One of the 6 labs is devoted entirely to the innovative teaching approaches and experimental applications of microcomputers in education.

The key to the success of the Taft School is an extremely motivated staff led by an innovative and concerned principal. Members of the Taft Middle School staff are also very enthusiastic about sharing their experience and expertise in the following areas: **funding, staff development, tool application software, managerial uses of technology, integrating computers into the regular curriculum, telecomunications.**



Seventh Grade Connection

Brookline Public Schools
Contact:
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Edward Devotion School
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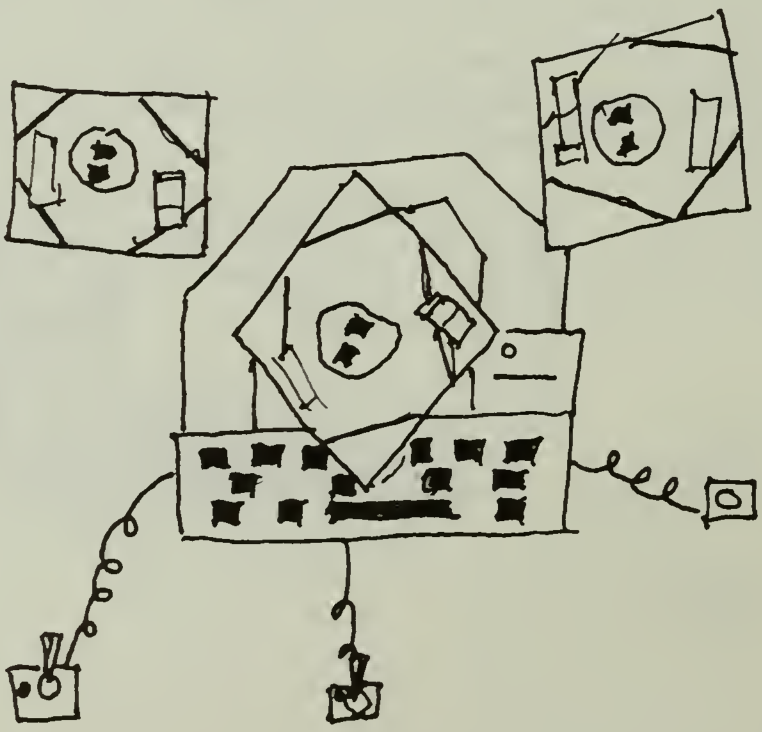
Brookline, MA 02146

The Seventh Grade Connection addresses computer education at the seventh-grade level through an interdisciplinary program that teaches computer and writing skills to a heterogeneous student population. This program is designed as a symbiotic relationship between English and computer science content and skills.

The computer science teacher teaches the basic skills needed for the students to become proficient users of BANK STREET WRITER. Instruction takes place 3 times a week for an 8-10 week period. Following the word processing instruction, each class of 7th graders uses word processing skills in a writing unit taught by the English teacher. Using the computer lab a minimum of 3 times per week for a 4-5 week period, students engage in the skills of editing and revision and develop a well written product.

As a result of this program, there has been an increase in the number of students using the computer lab during a free weekly activity period and using the word processor to work on other class assignments. There has also been an increase in students' use of the afterschool computer club time as well as early morning time for writing. The students' attitude towards the use of computers has become more positive. This program can be easily expanded to include an eighth grade curriculum. It can also be used to serve ESL students, learning disabled students, and multi-ethnic groups.



COMPUTER STUDIES
High School Level

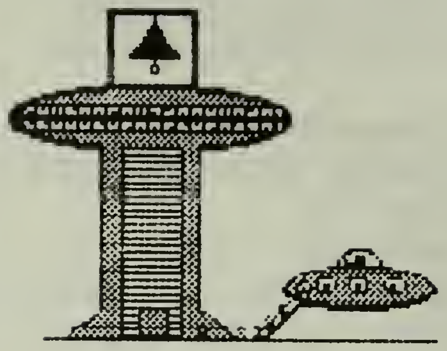
Comprehensive Computer Science Program
Dracut Public Schools
Contact:
James R. Ace
Dracut Senior High School
1540 Lakeview Avenue
Dracut, MA 01826

The Dracut High School computer science program integrates two different computer systems in a developmental sequence. Using a classroom of Apple IIe microcomputers and a classroom of Digital PDP 11/44 terminals, students are successfully educated in computer literacy, computer programming, and state-of-the-art computer applications.

All students are encouraged to participate in the program to the limits of their interest and ability. The developmental sequence in computer programming ranges from BASIC to PASCAL to Data Structures. Advanced students are prepared to take the Computer AP examination. Because of the depth of the program, students get involved with computers at the local college and university programs, as well as in business and industry. In addition to formal computer science courses, students learn to use computers as tools in subject areas like industrial arts, science, business, and mathematics.

This computer science program can meet the needs of most students in a comprehensive high school, without many major changes. It offers a broad based opportunity for students not in programming to acquire skills in those computer applications related to business and personal use (word processing, database management, and spread sheet analysis). This program can serve a large percentage of any student population, including those in special needs.

COMPUTER STUDIES
High School Level



Small Business Management with Computers

Minuteman Regional Vocational
Technical School District
Contact:
Sebastian R. Paquette
Minuteman Regional Vocational
Technical High School
758 Marrett Road
Lexington, MA 02173-7398

In today's vocational and business education there exists great opportunity for entrepreneurship. Realizing this and knowing the utility of microcomputers, a course was developed to provide students with understanding and practice in formulating customer files, inventory sheets, and salary structures. They were encouraged to apply their work to the establishment of new, or existing, small businesses as an electronic support to the total management process.

This program of small business and microcomputers presents a basic introductory computer study to a full class of shop students. Using data base filing, spreadsheet calculations, and word processing, students create functional business forms which can be applied immediately. In the class, the drill and practice software also helps them to develop keyboard skills and speed. Although the program is fully developed for a specific study area, students from other disciplines have enrolled in the course on a "space available" basis.

The content of the course may be applied immediately to the operation of a small business. Although the course was developed for a particular business, the information is applicable to the operation of almost any small business by simply changing a few labels.

Remarks

Presenting teacher will travel to school districts within Eastern Massachusetts. Visits to the Minuteman School are by appointment only.

Computer Studies
High School Level

Computer as a Tool
Wellesley Public Schools
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Alan November
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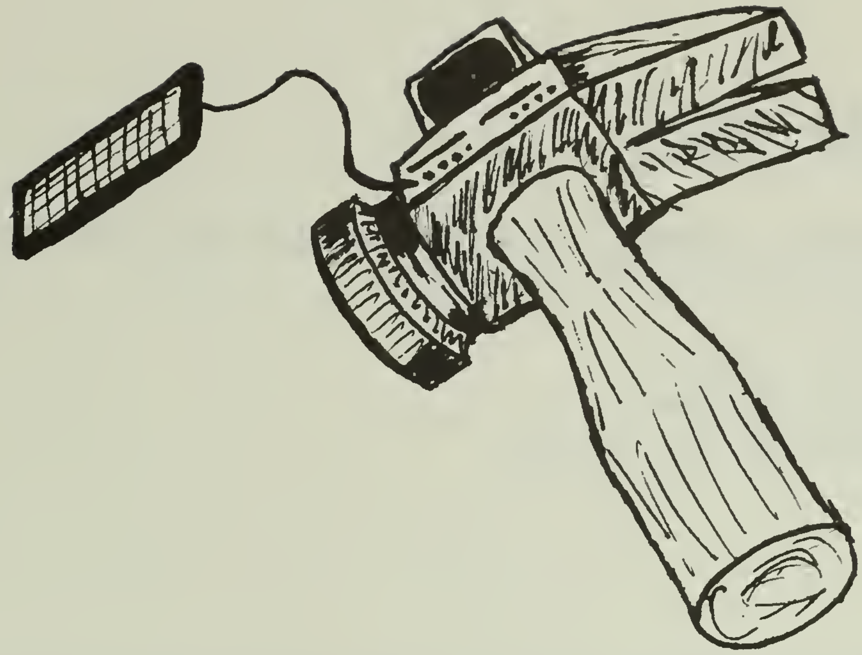
Wellesley, MA 02181



This is a computer literacy course that involves the student in learning how to apply fundamental tools of the computer (word processing, spreadsheets, and databases) to personal and community problems. Previously, computer courses were focused on computer programming and failed to attract students with less than a high level of achievement in mathematics. This course was designed to provide all students with access to computer problem solving tools that did not require any prerequisites or programming ability. Four general skills are stressed in this course: (1)teamwork, (2)making decisions with incomplete information, (3)gaining access to information, and (4)identifying suitable problems.

The course meets twice a week in a lab setting for one semester. Responsibility to identify problems and develop solutions is placed upon the students. Often these problems involve working with clients in the larger community. Students may become consultants to adults who do not completely understand the technology. For example, one student worked with the school nurse to begin to organize health records. Other students worked to help the school catering service to determine actual costs and profit and loss.

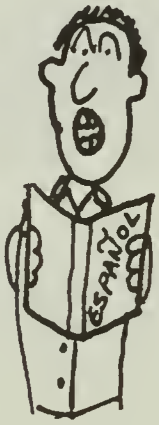
While this course is open to all students in the high school, it has attracted a large number of students who ordinarily would not elect a computer course. Extra efforts are made to work with special educators to involve students who have exhibited attendance and school attitude problems.

Elementary School Foreign Language Program
Springfield Public Schools
Contact:
Kathleen Riordan
195 State Street
Springfield, MA 01103

The Elementary School Foreign Language Program for grades 5 and 6 primarily focuses on developing good listening and speaking skills to prepare students for the continuing city-wide French and Spanish sequence. The teachers are committed to the development of listening and speaking skills. Informal exposure to the foreign language world is the basic approach.

The curriculum includes language and culture, and makes use of a variety of activities, role-playing situations, games, skits and art activities to introduce the students to the foreign language. Students learn poems, rhymes, and songs to reinforce the language concepts. French students in grade 6 participate annually in the National French Contest sponsored by the American Association of Teachers of French. Spanish students participate in the annual Listening Comprehension Contest for Springfield sixth graders. All foreign language students participate in the city-wide Recitation Contest each spring, and compete at their grade level.

Although listening skills are stressed, children do have active use of the language through class activities, games, and role plays. Integration with the social science curriculum can also enhance cultural awareness.



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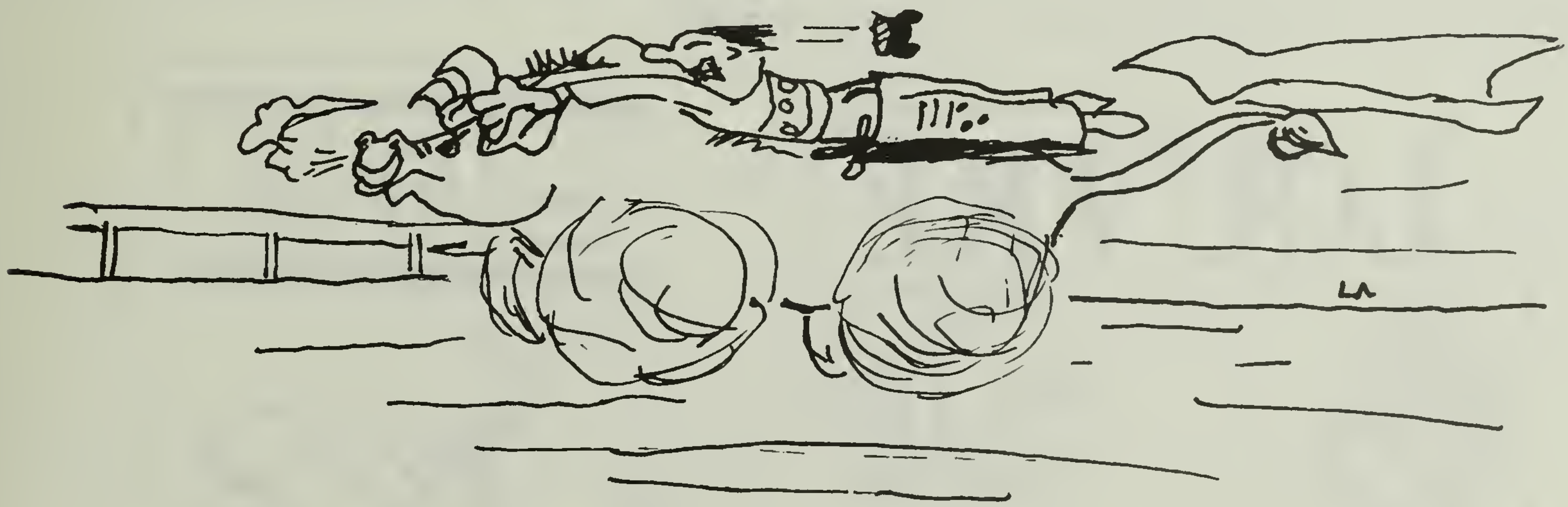
Foreign Language
Elementary School Level

Spanish K-4
Springfield Public Schools
Contact:
Kathleen Riordan
195 State Street
Springfield, MA 01103

This program was started in response to the need for instruction in Spanish language and increased cultural sensitivity for predominantly English speaking students.

The K-4 Spanish program is an activity based language and culture program. All students receive weekly language instruction. The teachers use songs, games, dances, and poems which are culturally authentic and linguistically valuable. Students are encouraged to use the language with each other. The curriculum is coordinated with regular classroom units. Beyond the classroom the students participate in school wide projects and assemblies as part of the multicultural approach of the program. The curriculum also emphasizes peer tutoring. This helps promote multicultural awareness, heritage, and pride. It also helps the native English speaking students to recognize the contributions of Spanish speaking peoples.

An elementary foreign language program in any language, not necessarily Spanish, can be adopted in any school system where there is a large population of students whose native language is not English.



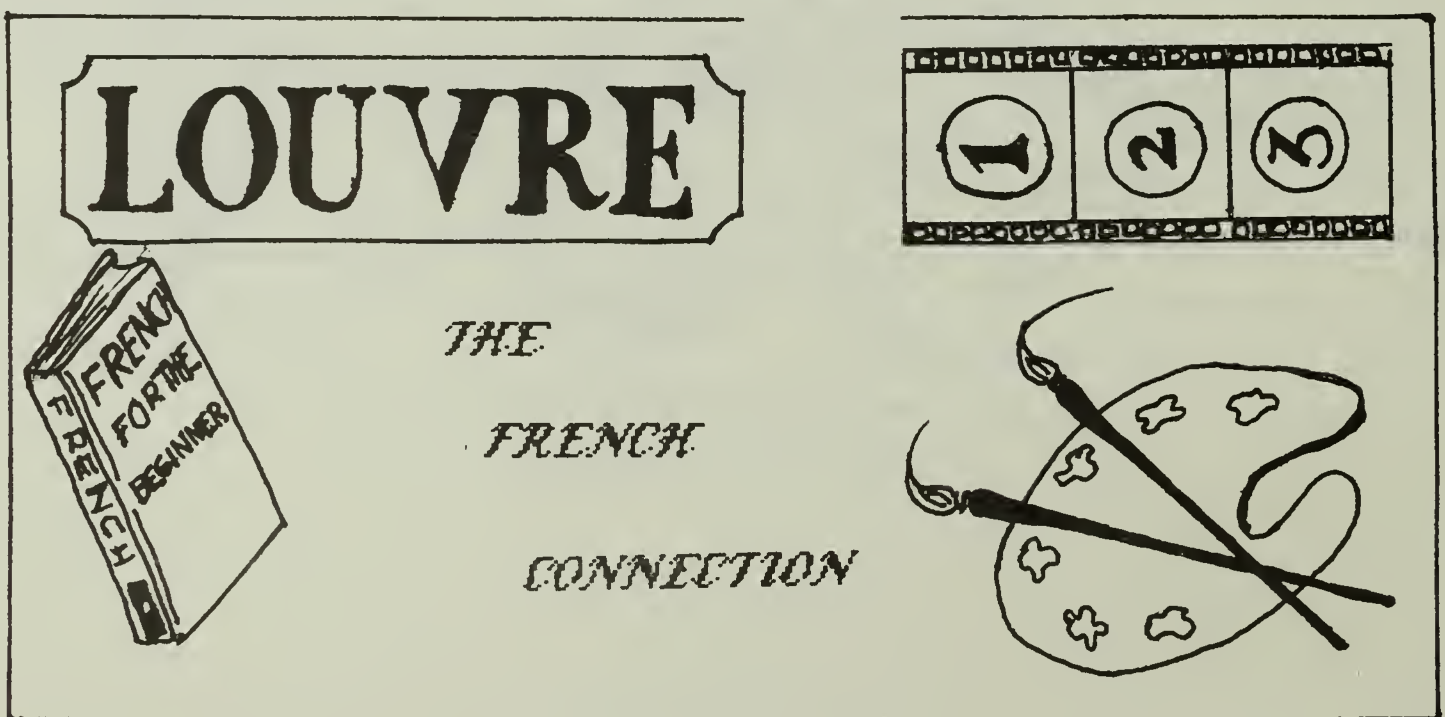
Foreign Language
Elementary/Junior High Level

The French Connection
Springfield Public Schools
Contact:
Kathleen Riordan
195 State Street
Springfield, MA 01103

The French connection is a program that integrates the resources of the Museum of Fine Arts and the George Walter Vincent Smith Art Museum with the French curriculum in the six junior high schools of Springfield. The goals of the program are to focus on French Art, to integrate the art materials into the French curriculum, and to introduce teachers, students and their families to the museum environment. The museum educators, the French teachers, and the Foreign Language supervisor had conferred for preliminary collaborative planning. Then there was a summer workshop which provided the opportunity for more in-depth collaboration.

Each French class participates in the French Connection over the course of the second semester. The program includes (1)classroom activities such as vocabulary and art techniques, (2)gallery experience, and (3)studio experience. At the Museum of Fine Arts, gallery space adjoining the French galleries has been reserved for an exhibition of the students' studio art projects.

All foreign language students can benefit from collaborative efforts such as these. A program such as the French Connection offers a cultural and language experience to urban students and their families, many of whom do not regularly visit museums and are below the poverty line as established for participation in the free or reduced price lunch program.



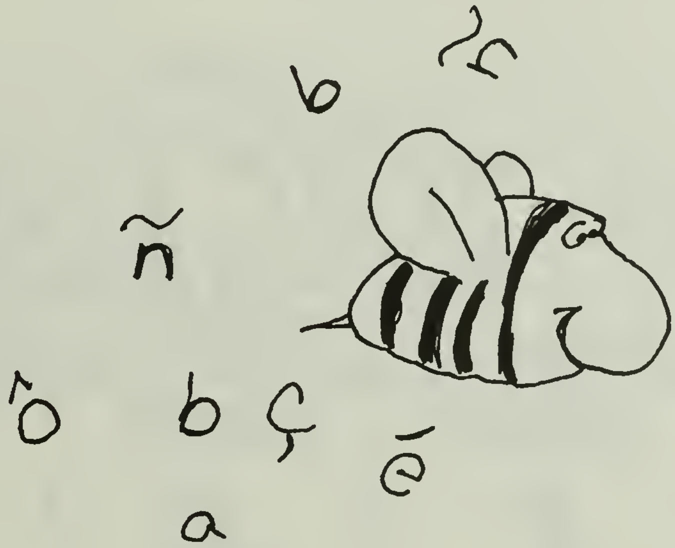
FOREIGN LANGUAGE
Middle/Junior High

French/Spanish
Southbridge Public Schools
Contact:
Ralph Julian
Mary E. Wells Jr. High
Southbridge, MA 01550

Given the challenge of deciding what system of instruction best met the needs of students in a middle school setting, the teachers and language department chairman settled on a model where 60% of 6th grade students would take French or Spanish based on the recommendation of teachers and parents. Eighty percent of the students who start their foreign language in 6th grade continue with the high school foreign language program.

The sucessful continuation of language study is attributed, in part, to the three full years of study that students receive at the middle school level before they take the second year of their language at the high school. In the past they tried half a year of Spanish and half a year of French as an introduction and found the results to be less than satisfactory. The additional activities of a European soccer tournament, a foreign language club, and foreign language spelling bees are used as motivational opportunities for the students.

This model is appropriate for school systems that have 6-8 middle schools rather than 7-8 junior high schools. The three years of practice in first year language gives students a better preparation than 2 years, and they can start when there is less academic pressure from other subject areas.



FOREIGN LANGUAGE
High School Level

French Films: Entertainment for Education

Boston Public Schools
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Boston Latin School
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Boston, MA 02115

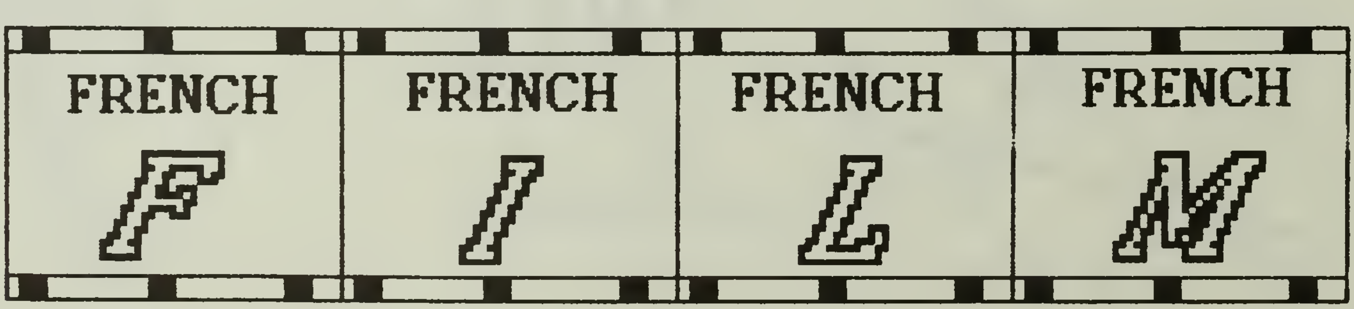
Most foreign language programs do not have a fifth-year course; and even if a program does provide a fifth-year course, it would be only for the Gifted and Talented group. In the Boston Latin School, there are numerous students who are interested in taking a fifth-year course in French but are hesitant about taking an honors course. This course (French Films) is designed to specifically address the needs of these students.

A film may be an independent lesson. It may also be used as a cultural vignette commenting on a literary work studied, a reinforcement of a lesson on a particular period of time in French literature or philosophy, or an additional piece of work by a familiar author. Following the showing of a film, there is class discussion in French, and written assignments are given. The curriculum also includes films and news broadcasts from France.

The success of this program is evidenced in the increase of aural comprehension, conversational vocabulary, cultural awareness, and in heightened motivation and interest. Using two works by the same author, one in print and one in film, doubles the amount of material covered in a regular class. This program may also be adopted for use as supplement to a fourth-year French curriculum, or as a fifth-year program in other foreign languages. Films and news broadcasts can be excellent resources for cultural enrichment.

Remarks

(1) School systems which have a VCR and TV available would make presentations much easier.
(2) Visits to Boston Latin School should be confirmed two weeks in advance to allow for arrangements to be made.



FOREIGN LANGUAGE
High School Level

Project VCR Video Classroom Resources
Lincoln-Sudbury Regional High School
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Lincoln-Sudbury High
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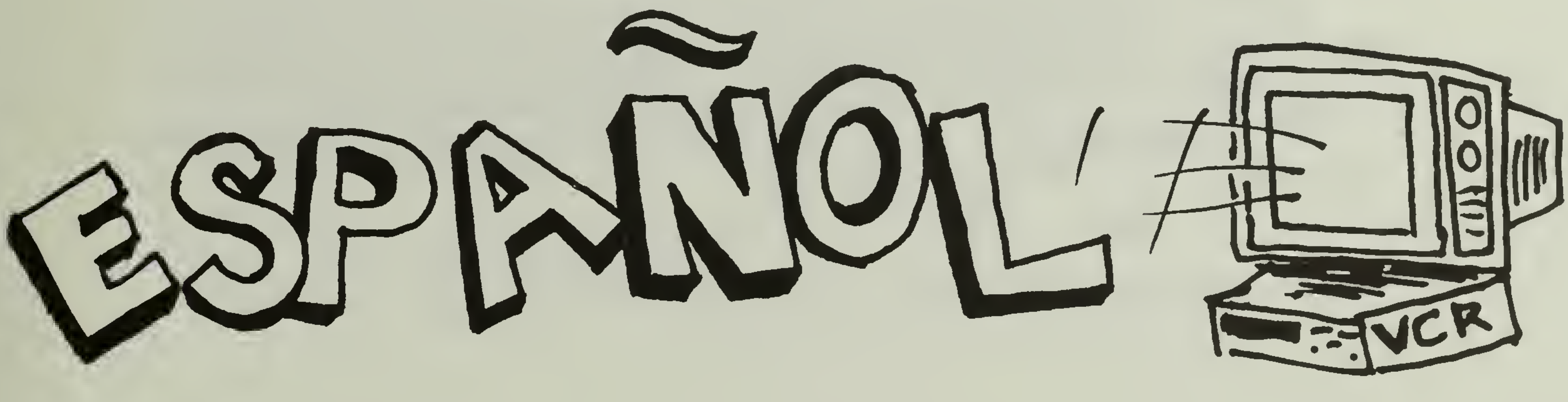
Sudbury, MA 01776

Project VCR fulfills the need for oral proficiency in foreign language as a direct response to a national mandate to produce speakers of other languages. Through student written, directed and performed video productions, students "do with" rather than "study about" language.

Project VCR is a proficiency-based Spanish program in which the video productions contribute to 35%-40% of the course work. While students have traditionally organized classes, they also become actively involved with practising for the video productions, filming, coaching, and eventually critique. Students not only get training in language skills, but also in communication skills and public speaking. Other talents such as those in music and drama come forth, which were not previously noted. Foreign students in the school are invited to be in video productions. This promotes cultural exchange.

This program can be easily adopted for any foreign language, and also for other subjects such as social studies. Moreover, Project VCR expands to the classroom the technologies which are used mostly out of school. Such use of educational technology facilitates the dimension of student evaluation which was previously measured solely through achievement tests.



FOREIGN LANGUAGE
High School Level

Teaching for Proficiency
in
Honors First Year Spanish
Wellesley Public Schools
Contact:
Miriam S. Grodberg
Wellesley High School
50 Rice Street
Wellesley, MA 02181

Most honors programs in foreign language are for students who have gone beyond the first level by their freshmen year. This program is a full year honors course for gifted students who have not had any exposure to Spanish, either because they are taking Spanish as a second foreign language, or because they have transferred from another school system. The model has been expanded to include honors first year French and German.

The curriculum has been designed to achieve appropriate proficiencies in speaking, listening, reading, and writing. Students are evaluated according to guidelines adapted from the revised ACTFL Proficiency Guidelines. Civilization, history and geography are built into the language program so that the students learn to appreciate the Spanish culture while the four basic skills are being reinforced. The entire class is conducted in Spanish.

This program is one of the few proficiency-based programs in the state. Furthermore, it can be easily adopted for other foreign languages and for classes with average paced students.

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